Tesla's Model 3 as Ikon of the Fourth Industrial Revolution

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FEEDBACK

Information

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March 31, 2016: Around the world people are queuing in front of Tesla stores in order to reserve a Model 3 for a $1000.00 US deposit—without knowing basic facts about the car, without even knowing what the car will look like. Nevertheless, within the first 24 hours *before* its April 1st presentation Tesla received over 100,000 reservations. A week later that number had increased to 325,000.[i] And after a month the revenue of the deposits had reached $20 billion US. While most of these figures rely on Tesla's own calculations, it is safe to say there are hardly comparable preorder numbers in the history of the Western economy, and certainly not in the automotive industry.

The "hype" surrounding the Tesla Model 3 and its public debut has been likened to the anticipation and enthusiasm with which new Apple products are met, however in the case of the Model 3 there is an important distinction. Here we are not talking about a $600.00 US smart phone, we are talking about a car—a car with a baseline price of $35,000 US, a car whose delivery is not expected until the end of 2017, and that from a company who in the past has not always honored their projected delivery dates. In this sense we are dealing with an unprecedented phenomenon.

The Model 3 is the fourth car produced by Tesla, and incidentally I think its significance may be such that it comes to epitomize the so-called fourth industrial revolution. Historically, major advances in manufacturing technologies have marked industrial revolutions. For instance, the first industrial revolution was initiated by steam engine powered mechanization and is aptly symbolized by the steam engine. For the second industrial revolution the car, particularly Ford's Model T, signifies assembly line based mass production. The third industrial revolution saw the automation of mass production and is also represented by the car, though not of any particular model.

The term "fourth industrial revolution" or "industry 4.0" was introduced by the German government in 2011 to describe intelligent network manufacturing processes.[ii] In fact, this year's World Economic Forum in Davos, Switzerland—one of the world's principal economic events, bringing together business leaders, politicians and academics—was entitled *Mastering the Fourth Industrial Revolution*, and gave some suggestions as to what intelligent manufacturing might look like. Klaus Schwab, the founder of the World Economic Forum, lists a few areas where we can expect major changes in the "industrial" world: the "physical" (autonomous driving, 3D printing, self-improving robotics, etc.), the "digital" (technological platforms like *Uber*, which does not own cars but organizes rides), and the "biological" ("genetic sequencing, and, lately . . . activating or editing genes."[iii]).

Moreover, the ease with which digitalization allows the above areas to connect enables the manufacturing process to become more decentralized. For example, if linked computers are able to find the cheapest parts for products from different manufacturers through the cheapest delivery methods, there is no longer any need to steer the manufacturing process on site. Rather, one need only steer manufacturing robots—an operation which might be done from anywhere. It is even conceivable that the products of intelligent manufacturing may one day be capable self-improvement independently of the (human) consumer, i.e. self-healing material or self-learning robots. Ultimately, the fourth industrial revolution will bring the marginalization of the human component in the manufacturing process as no industrial revolution has before, which necessarily prompts the question: Will the fourth industrial revolution also issue in an era of

technological singularity?

Technological singularity has been described as "the prospective development of human-level artificial intelligence, rapidly followed by the arrival of superhuman-level artificial intelligence, precipitating an unprecedented level of social change."[iv] The risks of technological singularity are widely discussed in the public (e.g. through the open letter "Research Priorities for Robust and Beneficial Artificial Intelligence" from the *Future of Life Institute*, signed e.g. by Nick Bostrom, Stephen Hawking, Elon Musk[v]). Nevertheless the discussion around future impact of the fourth industrial revolution—where technological singularity, and its risks, might be truly relevant for the first time—has been surprisingly quiet.

Driven by digitalization, decentralization and a tendency towards a technological singularity, the impact of the fourth industrial revolution will be enormous. Klaus Schwab of the World Economic Forum states: "It builds on the digital revolution and combines multiple technologies that are leading to unprecedented paradigm shifts in the economy, business, society, and individually. It is not only changing the 'what' and the 'how' of doing things but also 'who' we are."[vi] He also points to the velocity of the fourth industrial revolution: "Contrary to the previous industrial revolutions, this one is evolving at an exponential rather than linear pace."[vii]It is my suspicion that the Tesla Model 3 is a harbinger of things to come for the three following reasons:

Firstly, it is a simple fact that revolutions—in order to be recognized as revolutions—must involve masses of people. The Model 3 will be the first of all Tesla's models that is a **car for the masses**. With an anticipated base price of $35,000 US it is by far the most affordable Tesla ever produced, and its performance features, like range, acceleration, and—presumably—full autonomous driving, will outclass its similarly prized competitors (the BMW i3, Chevrolet Volt, Nissan Leaf, etc.). I do not mean to imply that outdoing its competitors would alone make the Model 3 iconic of an entire revolution. It is difficult to determine how and why certain products become representative of their respective industrial revolutions. Still, remembering Ford's Model T, one factor might be a combination of innovation and price-policy: A product with the "aura" of innovation does not have to be cheap, but cheap enough to be affordable for the masses. And according to the pre-order numbers, the Model 3 is *already* a mass-product.

Secondly, Tesla manufactures automobiles at the **intersection of a longstanding tradition of car culture and the age of digitalization.** Tesla customers do not have to rethink "cars." In contrast to other products of the fourth industrial revolution, like "Bitcoin", Block Chains and advanced robotic, which require the customer to have a sophisticated IT comprehension in order to understand the basic use of the product. Rather, other than its perhaps unfamiliar electric engine, the Model 3 still functions and looks like a regular car: it has tires, suspension, a steering wheel, a break pedal, etc. The Model 3 also partially conforms to the expectations of conventional car culture in terms of how it is made. The manufacturing process is bound to the customary idea of a factory. Tesla is even building a "traditional" factory, called the "Gigafactory," a lithium-ion battery factory in the desert of Nevada with the biggest factory building (by physical area)[viii] in the world.

However, though the Model 3 may look and handle like an ordinary car, under the hood many aspects of the fourth industrial revolution are already involved: Like all Teslas, the Model 3 will be self-improving, self-learning to help create the basic parameters for future full-autonomous driving. Every Tesla currently on the road is connected to Tesla's headquarters and delivers non-stop real-time information about its own status (battery power, speed, engine consumption, etc.) and about the streets it is driving on.[ix] The goal is a car that steers safely through predictable traffic and weather patterns. The current Teslas are "learning" today how to drive autonomously tomorrow. In other words: Current Teslas are co-building the autonomous driving mode of the Model 3.

The Model 3 will combine both the traditional archetypal car built in a factory with the innovative promise of autonomous driving. Moreover, among other car projects from major companies, like Google, who are also on the task to build "intelligent" cars, Tesla has the advantage as it already has hundreds of thousands of cars on the road, cars that are driving billions of miles—independently, by "real" customers. All those Teslas are collecting information, information that will be needed for the successful autonomous driving of the Model 3.

Thirdly, autonomous driving might improve **speed**. In history, speed is highly connected to industrial revolution in general and specifically to cars and car manufacturing: As the speed of cars, and the speed of the industry, the car manufacturers. The actual speed of the cars is the result of technological improvement. Through the improving speed of manufacturing, technological improvement is available faster, cheaper, and therefore open to a large number of customers. In other words: Speeding up the manufacturing processes delivers more money to the manufacturer, and improvements in manufacturing transfer new technology faster and cheaper to the customers.[x] The fourth industrial revolution is—according to Schwab—speeding up to a new level. Different from the past industrial revolution, we will face a speed level that is not so much connected to the manufacturing process itself as to our daily life. Major improvement in speed is expected through the interlinking, communicative ability of the products.

To stay with the car example: Connected cars and especially self-driving cars will speed up traffic. It is not a long way anymore from current real-time detour recommendations to fewer accidents through future self-driving cars. Autonomous cars do not tailgate, speed or fall asleep. Still, even though self-driving systems are already working on the highway, it should be stressed that at this stage they are not meant to be entirely independent; they are still in learning mode. The recent fatal accident in Florida involving a Tesla Model S driving in autonomous mode has upset public opinion concerning autonomous driving and will likely, for now, keep Federal and State legislators leery. Nevertheless, as the technology behind autonomous driving improves, road safety in total will also improve. And, the car industry finally could fulfill their old promise: *Speed*—Buy the new car and you will reach your goal **faster**! Although this was always one of the most important selling points of the car manufacturer since mass-motorization there is every year more and more trouble to keep the traffic-speed. That will—and that is the basic promise of the autonomous car—soon be changed.

Through interconnectivity with other cars, in monitoring streets and weather conditions—by cameras, radar, infrared, Internet—the autonomous driving car not only creates less congestion, it is no longer in need of human steering. The future of driving—and, by implication, the Model 3 too—is at once fascinating and fundamental. We are used to seeing automobile driving as the ultimate form of individual, human steering. Through the Model 3 more people than ever will be facing changes not only of "what" and "how" we drive but also of "who" we are. Who will we be when we are no longer in the "driver's" seat?

Marcel Schmid's first book, *Die kurze Geschichte eines endlosen Verfahrens,* already situates itself on the innovative interface between literary analysis, cybernetics, and technology. His current project-in-progress is titled "Serial Repetition: Media Reflection around 1800, 1900, and 2000." His interest in cars and the automotive industry is not casual. He holds a 2014 Ph.D. in *Germanistik* from the University of Zurich. http://www.ds.uzh.ch/Neue/personen.php?show=assfor&detail=462

Notes

[i] Anita Lienert, "2018 Tesla Model 3 Reservations Exceed 325,000," in: *Edmunds.com,* April 8, 2016, http://www.edmunds.com/car-news/2018-tesla-model-3-reservations-exceed-325000.html (4/15/2016).

[ii] Markus Löffler, Andreas Tschiesner (Interview), "The Internet of Things and the future of manufacturing," in: *McKinsey&Company*, June 2013, http://www.mckinsey.com/business-functions/business-technology/our-insights/the-internet-of-things-and-the-future-of-manufacturing (4/10/2016).

[iii] Klaus Schwab, *The Fourth Industrial Revolution*, World Economic Forum Cologny/Geneva, p. 21.

[iv] Murray Shanahan, *The Technological Singularity*, MIT Press Cambridge MA, London/England, p. 231.

[v] http://futureoflife.org/ai-open-letter/

[vi] Schwab, p. 3.

[vii] Schwab, p. 3.

[viii] Jack Crosbie, "Tesla's Model 3 Gigafactory Will Have the 'Largest Footprint of Any Building' in the World. Elon Musk has no problem going big," in: *inverse*, April 1, 2016, https://www.inverse.com/article/13633-tesla-s-model-3-gigafactory-will-have-the-largest-footprint-of-any-building-in-the-world (4/4/2016).

[ix] For more information see: Levi Tillemann, Colin McCormick, "Will the Tesla Model 3 Be the First Truly Self-Driving Car?," in: *The New Yorker,* April 14, 2016,

http://www.newyorker.com/business/currency/will-the-tesla-model-3-be-the-first-truly-self-driving-car

[x] For the relation of industrial revolution and speed, please see: Hartmut Rosa's work on *Alienation and Acceleration*, and Paul Virilio's work on *Dromology*.

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